

English Summary

This thesis takes its departure in a practical problem. How do we qualify the engineering students at Aalborg University to participate in project work? The method is to develop the supervision. This is done on the basis of Donald Schön's theory about supervising the reflective practitioner [Schön 1987]. In addition to this a theoretical understanding of learning in a reflective practicum is sought. Furthermore a number of concrete methods are developed and implemented through a casestudy during the first 3 semesters on the engineering study.

The research is based on the paradigm of dialog research. Through the casestudy I have had a dual role of being the supervising two groups of students and at the same time the researcher, researching in the process.

In the theoretical part of the thesis, a theoretical understanding of Schön's theory of supervising the reflective practitioner is sought. Specially his concept of *reflection – in – action*. This understanding is further qualified by means of Robert Pirsig's concept of *quality* [Pirsig 1974]. In that connection it is stressed that a stronger focus on the intuitive part of the learning process is essential in connection with educating the reflective practitioner. According to Dreyfus & Dreyfus's learning phenomenology, the intuitive part of the learning process is necessary in the development of expert skills. Two central skills for the reflective practitioner are therefore conscious reflection and intuitive attention. Together these two sources of realization are fundamental in the student's learning process.

Schön's supervision method is recognised as an operative version of Luhman's general theory of operative constructivism. On the basis of Luhman's theory a general model for teaching is developed. The model forms the theoretical foundation for developing and implementing the supervision function in the domain of problem based and project oriented study at Aalborg University.

The supervision function is divided in two types of supervision. Supervision of a group of students and supervision of the individual student. The supervision of the group has been implemented as the reflective type of communication that Schön names as *reciprocal reflection – in – action*. One aspect of this is that it is an experimenting and reflective communication through which the supervisor and the students through respectively telling and demonstrating – and listening and imitating, develop

mutual understandings of the theme of the communication. It is a way of communication that respects the project pedagogy's principal of exemplarity.

Another aspect of the supervising function, has been to offer the students individual supervision. This supervision consist of commenting and discussing the students reflective learning journal in a dialog with the student. The reflective learning journal is a media that has been used as a way to stick to the ongoing dialog about the students learning process. The casestudy point towards the idea that the reflective learning journal, together with a reflective dialog with the supervisor, forms a potential for the students learning process. This is specially the case in connection with the development of skills necessary to participate in the project work, whereas the learning outcome in connecting with the cumulative subjects in the domain of naturscience, only is affected indirectly though the students reflective planning of their study. Another finding from the casestudy is that the reflective learning journal (fravælges ?) when the student feels loaded from other studyactivities.

In connection with supervising a group, the projectgroups have used (målformuleringer ?) as a mean to sustain the reflections about the connections between projectactivities and learning objectives. One finding from the casestudy suggest that if the students is thought to benefit form writing (målformuleringer ?) they (målformuleringerne) should enter the curriculum and time must be allocated to make it possible for the students to prepare them.

One consequence of using the constructivistic educational model, is that the projectassessment should be based on what may be called selfassessment through a dialog with the assessor. This dialog takes it's departure in the final version of the (målformulering) which is called an (skriftligt evalueringsoplæg ?).

One finding suggest that the students develop skills necessary to participate in the project work through the communicative process Schön calls reciprocal reflection – in – action. Another cautious finding suggests that development of such qualifications catalyse the learning of the cumulative subjects of the engineering study.